

**NONPROVISIONAL PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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**BOX PATENT APPLICATION**

**NONPROVISIONAL APPLICATION TRANSMITTAL  
RULE §1.53(b)**

Director of the U.S. Patent and Trademark Office  
Washington, D.C. 20231

Sir:

Transmitted herewith for filing under 37 C.F.R. §1.53(b) is the nonprovisional patent application

For (Title): A mold for manufacturing a stick

By (Inventors): Francois SMOLAREK

- ☒ Formal drawings (Figs. 1-2; 1 sheets) are attached.
- ☐ A Declaration and Power of Attorney is filed herewith.
- ☐ An assignment of the invention to \_\_\_\_\_ is filed herewith.
- ☒ An Information Disclosure Statement is filed herewith.
- ☐ A statement to establish small entity status under 37 C.F.R. §§1.9 and 1.27 is filed herewith.
- ☐ A Preliminary Amendment is filed herewith.
- ☐ Please amend the specification by inserting before the first line the sentence --This nonprovisional application claims the benefit of U.S. Provisional Application No. \_\_\_\_\_, filed \_\_\_\_\_.
- ☒ Priority of foreign application No. 99 07535 filed June 15, 1999 in France is claimed (35 U.S.C. §119).
- ☒ A certified copy of the above corresponding foreign application is filed herewith.
- ☒ The filing fee is calculated below:

**CLAIMS IN THE APPLICATION AFTER ENTRY OF  
ANY PRELIMINARY AMENDMENT NOTED ABOVE**

FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	9 - 20	= 0
INDEP CLAIMS	1 - 3	= 0
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIMS PRESENTED		

\* If the difference is less than zero, enter "0"

**SMALL ENTITY**

RATE	FEE
	\$ 345
x 9 =	\$
x 39 =	\$
+130 =	\$
<b>TOTAL</b>	<b>\$</b>

OR  
OR  
OR  
OR  
OR

**OTHER THAN A  
SMALL ENTITY**

RATE	FEE
	\$ 690
x 18	\$0
x 78	\$0
+260	\$0
<b>TOTAL</b>	<b>\$690</b>

- ☒ Check No. 109292 in the amount of \$690 to cover the filing fee is attached. Except as otherwise noted herein, the Director is hereby authorized to charge any other fees that may be required to complete this filing, or to credit any overpayment, to Deposit Account No. 15-0461. Two duplicate copies of this sheet are attached.
- ☐ This application is entitled to small entity status. DO NOT charge large entity fees to our Deposit Account.

Respectfully submitted,

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### **Application Information**

Title Line One:: A mold for manufacturing a stick  
Title Line Two::  
Title Line Three::  
Title Line Four::





## A MOLD FOR MANUFACTURING A STICK

The present invention relates to a mold for manufacturing sticks, in particular for cosmetic use.

The invention is particularly adapted to making  
5 sticks for lipsticks, deodorants, or blusher wands.

### BACKGROUND OF THE INVENTION

European patent application EP-A-0 686 468 discloses a method of manufacturing lipstick sticks.

That known method uses a flexible mold which is  
10 thermally conditioned prior to introducing therein a predetermined quantity of a composition in the molten state for constituting a lipstick stick after it has cooled and solidified.

The stick is unmolded in two stages.

15 In a first stage, suction is applied to the outside of the mold, but at its top end only, so as to cause said top end to expand and provide annular clearance around the stick inside the mold.

This clearance enables the stick to be engaged in an  
20 extractor member, e.g. constituted by the cup of a lipstick case, while the bottom portion of the stick continues to be held by the mold.

In a second stage, once the extractor member has been engaged on the stick, suction is exerted on the  
25 outside of the mold over its entire height so as to separate the bottom portion of the stick from the mold, thereby facilitating removal of the stick.

The material selected for making the mold must satisfy various requirements, and in particular:

- 30 - it must be physically and chemically compatible with the stick-constituting composition;
- it must withstand the temperature of said composition in the molten state, i.e. about 100°C;
- it must withstand the mechanical and thermal  
35 stresses to which it is subjected during a stick-manufacturing cycle; and
- it must be dimensionally stable.

## OBJECTS AND SUMMARY OF THE INVENTION

The present invention seeks to make it easier to select the material for constituting the mold, for example in order to make it possible to use materials that enable the lifetime of the mold to be extended.

The invention achieves this by the fact that the side wall of the mold includes zones of weakness facilitating radial deformation thereof.

Thus, in the invention, the ability of the mold to deform in order to unmold the stick of lipstick is not only the result of the elasticity specific to the material used for making the mold, but also the result of the above-mentioned zones of weakness being present, and this presents numerous advantages.

In particular, the mold can be made out of materials that are less flexible than those presently in use but that have better strength, either because they have better chemical compatibility with the composition of the stick, for example, or, when the stick is made of material that has extrinsic plasticity obtained by adding a plasticizer, because it is possible to avoid problems associated with plasticizer exudation, thereby reducing plasticizer content, for example.

In a particular embodiment, it is possible to act on the outside shape of the mold to reduce the thicknesses of its walls, thereby simultaneously increasing the suitability of the mold for deformation and improving heat exchange.

In a particular embodiment, the zones of weakness are obtained by means of recesses made in the side wall of the mold.

Preferably, the recesses extend longitudinally over substantially the entire height of the mold all the way to its bottom end.

In a particular embodiment, the said recesses are constituted by notches that are uniformly distributed in the periphery of the mold.

Preferably, the bottoms of the notches are rounded so as to avoid creating tear starters in the wall of the mold.

Still in a particular embodiment, the depth of the notches decreases on coming closer to the bottom end of the mold.

The maximum depth of the notches can be greater than or equal to 4 mm, for example, and the mold may have 16 to 20 notches, for example.

The wall thickness of the mold in the zones of weakness can be greater than or equal to 1 mm, for example.

#### BRIEF DESCRIPTION OF THE DRAWING

Other characteristics and advantages of the invention will appear on reading the following detailed description of a non-limiting embodiment of the invention, and on examining the accompanying drawing, in which:

- Figure 1 is a diagrammatic axial section of a flexible mold; and

- Figure 2 is a fragmentary cross-section on section plane II-II of Figure 1.

#### MORE DETAILED DESCRIPTION

The mold 1 shown in Figures 1 and 2 comprises an upwardly open cavity 3 having the shape of the stick that is to be made.

In the example described, the mold 1 is made of an elastomer material.

In particular, the mold can be made of a fluoro-silicone rubber, in particular one based on polysiloxanes, as described in patent EP-0 589 386, for example.

More specifically, it is possible to use a material of the kind sold by Dow Corning under the reference MX5412 or a material sold by Safic Alcan under the reference ALCAN SII S164V/100. Such materials are particularly suited to molding cosmetic compositions

containing polydimethyl siloxane (PDMS) type silicone as used in certain kinds of lipstick.

The cavity 3 of the mold 1 has a sloping bottom wall 4 which joins a circularly cylindrical surface 5 about an axis of symmetry X which is itself extended upwards, about halfway up the cavity 3, by two successive conical surfaces 6 and 7 about the axis X and converging towards the opening of the mold.

The top portion of the mold 1 has a flange 8 for fixing it to conveyor means.

The conical surface 7 opens out into the bottom of a depression 9 that flares upwards, defined downwards by a conical surface 10 and radially by a cylindrical surface 11.

The diameter at the base of the cylindrical surface 5 in the example described is about 9 mm, and the flat 4 slopes at  $65^\circ$  relative to the axis X.

The outside shape of the mold 1 is generally frustoconical up to the flange 8 and it expands upwards. It is possible to vary the outside shape of the mold in order to decrease the thicknesses of its walls.

Longitudinal recesses 12 are uniformly distributed angularly around the axis X in the periphery of the mold 1 to facilitate radial deformation thereof in a manner described in greater detail below.

In the example described, the mold 1 has eighteen recesses 12 in the form of notches that are angularly spaced apart at  $20^\circ$  intervals.

By way of example, the width of each notch 12 is 0.5 mm.

The bottom of each notch 12 is rounded and extends parallel to the axis X from the bottom end of the mold 1 up to the base of the mold wall that defines the depression 9.

The recesses 12 create zones of weakness which make it easier to deform the mold radially as mentioned above, while the zones of greater thickness between the recesses

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Naturally, the invention is not limited to making sticks of lipstick, but also applies to molding other compositions into the form of sticks.



## CLAIMS

- 1/ A mold for manufacturing a stick, in particular for cosmetic use, wherein the mold has a side wall which includes zones of weakness facilitating radial deformation thereof.
- 2/ A mold according to claim 1, wherein said zones of weaknesses are obtained by means of recesses made in the side wall of the mold.
- 3/ A mold according to claim 1, wherein said recesses extend longitudinally over substantially the entire height of the mold all the way to its bottom end.
- 4/ A mold according to claim 2, wherein said recesses are constituted by notches that are uniformly distributed in the periphery of the mold.
- 5/ A mold according to claim 4, wherein the bottoms of the said notches are rounded.
- 6/ A mold according to claim 4, wherein the depth of the notches decreases on coming closer to the bottom end of the mold.
- 7/ A mold according to claim 6, wherein the maximum depth of the notches is greater than or equal to 4 mm.
- 8/ A mold according to claim 4, having sixteen to twenty notches, and preferably eighteen notches.
- 9/ A mold according to claim 1, wherein the thickness of the mold wall in the zones of weakness is greater than or equal to 1 mm.

## A B S T R A C T

The invention relates to a mold for manufacturing a stick, in particular for cosmetic use. The side wall of said mold has zones of weakness for making the mold easier to deform radially, said zones of weakness being obtained by means of recesses formed in the side wall of the mold and extending longitudinally over substantially the entire height of the mold starting from its bottom end.

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